

Monitoring, Research & Laboratory Support

Puget Sound Management Plan Goals

- Assess the health of Puget Sound and its resources and communicate information to promote informed choices for the environmental management of Puget Sound.
- Establish and maintain a system of priorities and funding for research and dissemination of research findings.
- Assure the quality and timeliness of physical, chemical and biological laboratory testing.

Strategies for Achieving Goals

- Implement the Puget Sound Ambient Monitoring Program.
- Coordinate citizen monitoring.
- Coordinate and fund research, maintain a list of priorities and help make research results available to decision-makers.
- Review the capability of environmental laboratories to generate quality data and assure adequate laboratory support for sampling programs in agencies and other organizations, and develop and encourage the use of uniform guidelines for quality assurance.
- Develop and update protocols and guidelines to standardize the collection, analysis and transfer of data.

Background and Trends

Resource managers need sound, scientifically based information to make effective decisions about protecting Puget Sound.

The Puget Sound Ambient Monitoring Program (PSAMP) is a long-term effort to monitor and assess the condition of the Puget Sound ecosystem. Through PSAMP, federal, state and local agencies monitor marine and fresh waters, sediments, marine biological resources, nearshore habitat, and the effects of contaminants on fish. Every two years, the Action Team publishes *Puget Sound Update*, which summarizes the findings of the monitoring program and related studies.

Citizen monitoring can contribute valuable information to improve our understanding of Puget Sound. Action Team support staff encourage and support citizen monitoring of shoreline and marine conditions to supplement information developed by federal, state and local governments.

Research improves our understanding of Puget Sound and helps decision-makers evaluate options for protection. Since 1987 the research program has provided a regional focus to disseminate research findings.

The fifth Puget Sound Research Conference was held in February 2001. This conference provided an opportunity for scientists, resource managers and citizens to learn about new scientific findings about the Puget Sound ecosystem.

Since 1987, laboratories conducting analyses in Puget Sound are accredited by the Department of Ecology to ensure they can produce consistent data of a known quality. The agency audits these laboratories to maintain the highest possible standards of analysis and data reporting.

Updated Puget Sound protocols for station positioning were adopted in 2000. These and other Puget Sound protocols ensure the collection of

high quality data that can be used by other scientists.

Highlights of 2001-2003 Actions

- State agencies will continue monitoring and reporting on findings related to PSAMP topics, including the physical environment, pathogens and nutrients, toxic contaminants, human health and biological resources.
- PSAMP agencies will evaluate PSAMP.
- The Action Team support staff will work with agencies to publish and distribute *Puget Sound's Health 2002*.
- The Action Team and partners will host the sixth Puget Sound Research Conference.
- Fish and Wildlife will collect information on depressed fish stocks to assist in the development of management and recovery plans.
- The Department of Ecology will increase its level of activities by developing chemical-specific actions plans to reduce persistent, bioaccumulative toxic (PBT) chemicals, participating in a coordinated water quality monitoring partnership to evaluate the state salmon recovery strategy, and building and enhancing stream flow gauging capability among local agencies.

2001-2003 Budget for State Actions

Total Enhancement	\$639,359
Total Provided Funding	\$7,011,098

JOINT STATE AND FEDERAL ACTIONS		OUTCOMES		See page 9 for key.					
		Pri-ori-ty	Non-point	Sal-mon	Budget Code	PS Plan Element	Action ID		
The state departments of Ecology, Fish and Wildlife, Health, and Natural Resources; Action Team support staff; King County Department of Natural Resources; U.S. Fish and Wildlife Service; and Environmental Protection Agency will coordinate operation and evaluation of the Puget Sound Ambient Monitoring Program (PSAMP).									
DEPARTMENT OF FISH AND WILDLIFE									
	Puget Sound Ambient Monitoring Program (PSAMP) reports and products will be delivered on time. A review of PSAMP will be completed in 2002. Changes to monitoring activities will be made to meet recommendations from program reviews. The department will participate in the management and steering committees.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	DFW-0	M-1	160		
DEPARTMENT OF NATURAL RESOURCES									
	PSAMP reports and other products will be delivered on time. Monitoring activities will be adapted as indicated by decisions from the program review. External recommendations will be obtained for program improvements. The department will participate in the management and steering committees.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	DNR-01	M-1	160		
DEPARTMENT OF ECOLOGY									
	PSAMP reports and other products will be delivered on time.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	DOE-01	M-1	160		
DEPARTMENT OF HEALTH									
	Health will participate in the management and steering committees, actively coordinate monitoring activities, and assist in the development of an integrated, comprehensive monitoring strategy.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	DOH-01	M-1	160		
PUGET SOUND WATER QUALITY ACTION TEAM									
	PSAMP reports and products will be delivered on time. An external review of PSAMP will be completed in 2002. Changes in monitoring activities will be made to meet recommendations from program reviews.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	PSAT-02	M-1	160		

		See page 9 for key.					
STATE AGENCY ACTIONS	OUTCOMES	Pri-ori-ty	Non-point	Sal-mon	Budget Code	PS Plan Element	Action ID
DEPARTMENT OF FISH AND WILDLIFE							
Annually monitor the distribution and abundance of marine birds and mammals and contaminants in the tissues of marine mammals.	Spatial and temporal trends of marine bird and mammals and chemical contaminants in harbor seals will be reported and analyzed. Databases, atlases and geographic information system products will be developed for agencies, researchers, local jurisdictions and others. Data will be provided for Action Team performance measures.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	DFW-01	M-2	165
Annually monitor chemical contaminants in Puget Sound fish and the effects of contaminants on the health of fish.	Spatial and temporal trends of contaminant levels and associated indicators of fish health in fish species will be assessed. Biennial reports for each species monitored will provide information on the status and trends of contaminant levels in fish tissues. The database will be updated as new data become available, and information will be shared with agencies, researchers and others. Data will be provided for Action Team performance measures.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	DFW-02	M-2	166
Collect information on the biology and abundance of depressed marine stocks to assess the health of exploited stocks and help develop management and recovery plans. Sampling will occur in conjunction with ongoing PSAMP groundfish surveys.	Important groundfish species in Puget Sound will be monitored. Population models will be developed. Management and recovery planning will be facilitated, including recommendations for marine protected areas.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	DFW-07	M-1	167
DEPARTMENT OF NATURAL RESOURCES							
Measure abundance and biodiversity in biotic communities throughout the Sound through the Spatial Classification and Landscape Extrapolation (SCALE) project. Use intertidal flora and fauna as a measure of ecosystem health. The results are used for regional comparisons, control-impact studies, and long-term trends monitoring.	Critical results for selecting salmonid protection and restoration sites and for monitoring their success will be obtained. This will help the selection of mitigation sites and control/reference sites for mitigation and restoration monitoring. Ultimately this will assist in determining the effects anthropogenic stressors (bulkheading, pier construction, damming rivers, etc.) that change the physical environment have on habitat function. Continue to provide information linking biota to physical factors, to expand the analysis and to multiple years and larger geographic area (currently in South and Central Puget Sound). Data will be provided in the form of maps, GIS coverages and documentation.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	DNR-01	M-1	169
Inventory the floating kelp resources of the Strait of Juan de Fuca and outer coast	Data will be provided in the form of maps, GIS coverages and documentation for kelp coverage in 2001 and 2002.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	DNR-01	M-1	170

		See page 9 for key.					
STATE AGENCY ACTIONS	OUTCOMES	Pri-ori-ty	Non-point	Sal-mon	Budget Code	PS Plan Element	Action ID
DEPARTMENT OF NATURAL RESOURCES							
Long-term monitoring program to track temporal trends in the extent of eelgrass in Puget Sound. Program will detect trends (changes) in critical habitat and link these changes to stressors which in turn can be managed to preserve or restore habitats. This monitoring specifically concerns subtidal eelgrass and other vegetation types, all on state-owned aquatic lands, and their status and trends are largely unknown.	Regional trends in marine vegetation distribution and abundance will be assessed. Data will be provided in the form of maps, GIS coverages and documentation.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	DNR-01	M-1	171
DEPARTMENT OF ECOLOGY							
Monthly sampling will be conducted at established marine water and freshwater monitoring stations. Annual sampling will be conducted at long-term marine sediment quality monitoring stations. Monitoring results will provide baseline characterization of environmental conditions and trends in Puget Sound. Results of monitoring programs will be presented in annual or biennial reports. Data will be provided to support watershed planning, environmental indicators, 305(b), and 303(d) reports and the "Puget Sound Update."	Data will be managed in long-term databases and access to data will be provided via Ecology's web site.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	DOE-01	M-1	172
Continue to operate laboratory accreditation program, supporting new accreditation applications and accreditation renewals for private, federal, tribal and state laboratories.	Private, federal, tribal and state laboratories will be accredited according to established procedures and rules.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	DOE-01	L-1	173
Technical QA guidance documents will be updated. Assistance will be provided to agency staff in the development and application of sound quality management principles. Appropriate quality assurance and quality control procedures and documents will be developed or revised. Quality Assurance Project Plans will be reviewed and comments will be provided upon request.	Current QA and technical assistance will allow agencies and local organization to develop better QA/QC plans and will result in collection of better data.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	DOE-01	L-2	174
Conduct special studies designed to answer key questions or characterize and evaluate environmental conditions at specific sites within Puget Sound.	Special studies coordinated through the Puget Sound Ambient Monitoring Program Steering Committee will be conducted. Reports, conference presentations, and data analyzing the results of these selected special studies will be produced. Portions of Puget Sound will be studied, in coordination with the Puget Sound Ambient Monitoring Program Steering Committee, and will be designed to examine specific questions of concern involving key environmental variables (e.g. dissolved oxygen, chlorophyll concentration, salinity, fecal coliform bacteria, benthic community composition, etc.).	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	DOE-01	M-1	175

		See page 9 for key.					
STATE AGENCY ACTIONS	OUTCOMES	Pri-ori-ty	Non-point	Sal-mon	Budget Code	PS Plan Element	Action ID
DEPARTMENT OF ECOLOGY							
Develop chemical-specific action plans that will lead to the reduction and, where possible, elimination of persistent, bioaccumulative toxic (PBT) chemicals in the Puget Sound environment.	Action plans will be produced for some PBT chemicals. These plans will identify and encourage specific activities for government agencies and business and citizen groups to reduce and eliminate PBTs in the Puget Sound environment. A baseline monitoring program will be developed.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	DOE-01	M-0	176
Ecology will participate on the Watershed Health Monitoring and Assessment Committee established under Substitute Senate Bill 5637. This is an interagency committee jointly chaired by the Salmon Recovery Funding Board and the Governor's Salmon Office. It intends to refocus existing agency monitoring activities to implement a comprehensive watershed health monitoring program, with a focus on salmon recovery.	A coordinated system will be established to monitor and assess the ongoing health of watersheds as restoration and protection efforts are implemented as part of the state's salmon recovery efforts. A plan to redesign Ecology's water quality and salmon index monitoring in coordination with other agencies will be developed.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	DOE-01	M-0	177
Build and enhance stream flow gauging capability among local agencies and provide training, technical assistance and data management services to local entities in selected basins.	Stream flow gauging will be implemented in two additional Puget Sound basins. Stream flow information will be available for use in decisions about the sustainable, long-term management of water resources and salmon recovery.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	DOE-01	M-1	178
Integrate certification of laboratories that analyze drinking water samples into Ecology's lab accreditation program.	Improved service to laboratories through "one-stop" validation agency for laboratories. Enhanced efficiency for 54 laboratories currently in two laboratory validation programs.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	DOE-01	L-1	179
DEPARTMENT OF HEALTH							
Monitor shellfish for paralytic shellfish poisoning to identify trends and potential impacts to public health.	All PSAMP sampling sites will be monitored for levels of biotoxins per the specified frequency. Results will be used to identify potential effects on public health and trends in toxin levels.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	DOH-01	M-1	180
Monitor shellfish growing areas for fecal coliform bacteria to identify trends and potential impacts to public health.	All PSAMP growing areas will be monitored for fecal coliform bacteria per the specified frequency to identify trends and potential impacts to public health.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	DOH-01	M-1	181
Continue to involve volunteers and citizen monitoring groups in PSAMP activities.	Volunteers will be recruited and trained to collect samples for biotoxin monitoring.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	DOH-01	M-3	182
Prepare an annual report that compiles data, interprets results and recommends changes in the design of the monitoring program.	Annual PSAMP reports will be completed and submitted to the Action Team within established guidelines and timeframes.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	DOH-01	M-1	183

		See page 9 for key.					
STATE AGENCY ACTIONS	OUTCOMES	Pri- ori- ty	Non- point	Sal- mon	Budget Code	PS Plan Element	Action ID

DEPARTMENT OF HEALTH

Coordinate data management through a computerized system and assure that data meets requirements for quality-assurance. Continue developing the biotoxin portion of the integrated data system using GIS technology.	A new database module for biotoxin will be developed.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	DOH-01	M-1	184
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PUGET SOUND WATER QUALITY ACTION TEAM

Synthesize and communicate findings of the PSAMP and other scientific studies of Puget Sound.	Scientists, resources managers and citizens of the region will be informed about the condition of Puget Sound through the "2002 Puget Sound Update" (to be published in February 2002); regular features on monitoring the health of Puget Sound in the "Sound Waves" newsletter' "Puget Sound Notes" (to be published at least twice each year); and annual PSAMP science meetings.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	PSAT-02	M-1	185
Publish and distribute "Puget Sound's Health 2002."	The general public will be informed about the condition of Puget Sound as measured by the Action Team's environmental indicators.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	PSAT-02	M-1	187
Support citizen monitoring of nearshore and marine resources in the Puget Sound basin.	Citizen monitoring groups will be informed of possible funding opportunities through the development and dissemination of a database on funding sources. Citizen monitoring groups will help develop and share information about citizen monitoring protocols that will enhance the standardization and credibility of citizen monitoring efforts.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	PSAT-02	M-2	188